Positional Externalities Cause Large and Preventable Welfare Losses

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In traditional economic models, individual utility depends only on absolute consumption. These models lie at the heart of claims that pursuit of individual self-interest promotes aggregate welfare. Recent years have seen renewed interest in economic models in which individual utility depends not only on absolute consumption, but also on relative consumption. In contrast to traditional models, these models identify a fundamental conflict between individual and social welfare.

The conflict stems from the fact that concerns about relative consumption are stronger in some domains than in others. The disparity gives rise to expenditure arms races focused on positional goods—those for which relative position matters most. The result is to divert resources from nonpositional goods, causing welfare losses.

Compelling theoretical and empirical evidence confirms the importance of relative consumption in individual valuations. In light of this evidence, we must question the wisdom of economic policy recommendations stemming from models that ignore relative consumption.

I. Positional and Nonpositional Goods

To help fix ideas, consider two simple thought experiments. In each, you must choose between two worlds that are identical in every respect except one. The first choice is between world A, in which you will live in a 4,000-square-foot house and others will live in 6,000-square-foot houses; and world B, in which you

will live in a 3,000-square-foot house, others in 2,000-square-foot houses. Once you choose, your position on the local housing scale will persist.

If only absolute consumption mattered, A would be clearly better. Yet most people say they would pick B, where their absolute house size is smaller but their relative house size is larger. Even those who say they would pick A seem to recognize why someone might be more satisfied with a 3,000-square-foot house in B than with a substantially larger house in A.

In the second thought experiment, your choice is between world C, in which you would have four weeks a year of vacation time and others would have six weeks; and world D, in which you would have two weeks of vacation, others one week. This time most people pick C, choosing greater absolute vacation time at the expense of lower relative vacation time.

I use the term *positional good* to denote goods for which the link between context and evaluation is strongest and the term *nonpositional good* to denote those for which this link is weakest.[1] In terms of the two thought experiments, housing is thus a positional good, vacation time a nonpositional good. The point is not that absolute house size and relative vacation time are of no concern. Rather, it is that positional concerns weigh more heavily in the first domain than in the second.

II. The Conflict between Individual and Collective Interest

When the strength of positional concerns differs across domains, the resulting conflict

[1] The late Fred Hirsch coined these terms.

between individual and social welfare is structurally identical to the one inherent in a military arms race. To illustrate, consider rival nations faced with deciding how to apportion available resources between domestic consumption and military armaments. Each country's valuations are typically more context-dependent in the armaments domain than in the domain of domestic consumption. After all, having lower domestic consumption than one's rival might entail psychological discomfort, but being less well-armed could spell the end of political independence. The familiar result is a mutual escalation of expenditure on armaments that does not enhance security for either nation. Because the extra spending comes at the expense of domestic consumption, its overall effect is to reduce welfare. Note that if each country's valuations were equally context-sensitive in the two domains, there would be no arms race, for in that case the attraction of having more arms than one's rival would be exactly offset by the penalties of having lower relative consumption.

For parallel reasons, the modal responses to the two thought experiments suggest an equilibrium in which people consume too much housing and too little leisure.[2] In contrast, conventional welfare theorems, which assume that individual valuations depend only on absolute consumption, imply optimal allocations of housing and leisure. Is this default assumption a reasonable one? I consider this question from both theoretical and empirical perspectives.

III. The Nature of the Utility Function: Theoretical Considerations

No serious scientist denies that animal nervous systems were forged by natural selection. In the Darwinian view, animal drives were selected for their capacity to motivate behaviors that contribute to reproductive success. Reproductive success, in turn, is fundamentally about resource acquisition: other things equal, the more resources an animal has, the more progeny it leaves behind. What matters is not the absolute number of offspring an individual has, but rather how its progeny compare in number with those of other individuals. A specific trait will thus be favored by natural selection less because it facilitates resource acquisition in absolute terms than because it confers an advantage in relative terms.

Frequent famines were an important challenge in early human societies. But even in the most severe famines, there was always some food. Those with relatively high resource holdings got fed, while others often starved. On the plausible assumption that individuals with the strongest concerns about relative resource holdings were most inclined to expend the effort necessary to achieve high rank, such individuals would have been more likely than others to survive food shortages.

Relative resource holdings were also important for marriage. In most early human societies, high-ranking males took multiple wives, leaving many low-ranking males with none. Even in contemporary societies, sexual attractiveness is strongly linked to relative resource holdings. Here too, theory predicts that natural selection will favor individuals with the strongest concerns about relative resource holdings.

The motivational structure expected on the basis of theoretical considerations is thus consistent with the modal choice patterns in the two thought experiments. Evolutionary theory also helps identify the specific reference groups that are likely to matter most. In evolutionary terms, falling behind one's local rivals can be lethal, whereas comparisons with others who are distant in time or space are typically irrelevant. And as the empirical studies mentioned below confirm, it is local rank that matters most.

IV. The Nature of the Utility Function: Empirical Evidence

The hypothesis that concerns about local rank are part of the evolved circuitry of the human brain is supported by evidence of specific neurophysiological processes that respond to local relative position. For example, local rank appears to affect, and be affected by, concentrations of the neurotransmitter serotonin, which regulates moods and behavior. Within limits, elevated serotonin concentrations are associated with enhanced feelings of well-being. (The drug Prozac, widely prescribed for depression and

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[2] For a formal demonstration of this result, see Frank (1985).

other mood disorders, increases the effective concentrations of serotonin in the brain.)

In males, concentrations of the sex hormone testosterone appear to have a similar relationship with local rank. Reductions in local rank tend to be followed by reductions in plasma testosterone levels, whereas these levels tend to rise following increases in rank. A player who wins a tennis match decisively, for example, experiences a post-match elevation in plasma testosterone, and his vanquished opponent experiences a post-match reduction. As with serotonin, there is some evidence that elevated concentrations of testosterone facilitate behaviors that help achieve or maintain high local rank.[3]

Further evidence of the importance of relative position comes from studies of the determinants of happiness, or subjective well-being. Investigators find that, whereas average happiness levels within a country tend to be highly stable over time, even in the face of significant economic growth, individual happiness levels within any country at a given moment of time depend strongly on income (see Richard Easterlin, 1995). Recent work employing richly detailed panel data further confirms the importance of local comparisons. This work documents a robust negative association between individual happiness measures and average neighborhood income, a link that does not appear to stem from selection effects (Erzo Luttmer, 2004).

Concerns about local rank also affect labor-force participation—in some studies by much more than such traditional factors as local wage and unemployment rates. David Neumark and Andrew Postlewaite (1998) found, for example, that a woman whose sister's husband earned more than her own husband was 16–25 percent more likely than others to seek paid employment.

The hypothesis that local rank matters also has testable implications for the distribution of wages within firms (see Frank, 1984). If some value high local rank more than others, then economic surplus is maximized by having workers sort themselves into separate firms in accordance with their respective valuations. Within each firm, the equilibrium distribution of wages will be more compressed than the corresponding distribution of marginal products. In effect, the labor market serves up compensating wage differentials for local rank, much as it does for other nonpecuniary employment conditions. This pattern, which is widely observed, is inconsistent with models in which local rank has no value.

Changes in the distribution of income provide yet another opportunity to test for the presence of positional concerns. The permanent-income and life-cycle theories of consumption predict that consumption in every income category will rise in proportion to changes in income. Given observed income growth rates in the United States, the top 1 percent of earners should thus be spending about three times as much now as in 1979, while the median earner should be spending only about 15 percent more.[4]

In contrast, models that incorporate positional concerns predict that sharply increased spending by top earners will exert indirect upward pressure on spending by the median earner. When top earners build larger houses, for example, they shift the frame of reference that defines what others slightly below them on the income scale consider an acceptable or desirable house. And when those people respond by building bigger houses, they in turn shift the frame of reference for those just below them, and so on, all the way down. Thus the median size of a newly constructed house, which stood at less than 1,600 square feet in 1980, had risen to over 2,100 square feet by 2001—more than twice the increase predicted by traditional theories.[5,6]

Additional evidence supports the view that expenditure cascades in housing and other areas are at least in part a consequence of increased income inequality. For example, U.S. counties with higher earnings inequality have significantly higher median house prices, personal bankruptcy rates, divorce rates, and average

[3] For a review of studies of the relationships between local rank, serotonin, and testosterone, see Frank (1999 Ch. 9).

[4] ⟨www.inequality.org⟩
[5] ⟨http://www.census.gov/prod/2003pubs/02statab/construct.pdf⟩
[6] ⟨http://www.census.gov/hhes/income/histinc/f03.html⟩

commute times (Frank et al., 2005). Total hours worked, both across countries and over time within countries, are also positively associated with higher earnings inequality (Samuel Bowles and Yongjin Park, 2002). Models that incorporate positional concerns predict these links.[7] Traditional models do not.

V. Choosing a Default Model

Traditional models view the income tax as a wedge that causes people to expend too little effort. In contrast, positional models view this tax as a device for mitigating consumption externalities. Available evidence favors the latter interpretation, suggesting that most Americans would be happier and healthier if they worked not more hours but fewer.[8]

If theory and evidence suggest that positional concerns loom large in human motivation, why does the economics profession take no account of these concerns when formulating economic policy recommendations? In recent years, I have posed this question to a number of economists.

One suggested that positional models will be fully embraced once it can be shown conclusively that they track the data better than traditional models. Experience, however, suggests otherwise. A case in point is the history of modern consumption theory. Any successful consumption theory must accommodate three stylized facts: (i) as income grows over time, savings rates remain roughly constant; (ii) consumption is more stable over time than income; and (iii) high-income persons save at greater rates than low-income persons. James Duesenberry's (1949) relative-income hypothesis, which holds that a family's savings rate is an increasing function of both its position in its local comparison group and its own previous peak consumption, has consistently tracked these facts. In contrast, the competing life-cycle and permanent-income hypotheses accommodate them only through tortured ad hoc modifications. For example, the higher savings rates of

persons with higher permanent incomes are "explained" by positing a bequest motive for rich consumers. The speed with which windfall income is consumed is "explained" by asserting that consumers have unexpectedly short planning horizons.

In addition to tracking the three main stylized facts of consumption data, Duesenberry's model makes numerous other detailed predictions. For example, it correctly predicts that black families at a given income level will save at higher rates than white families with the same income. The permanent-income hypothesis and the life-cycle hypothesis, both of which disavow any role for context in consumption decisions, predict that families will save at the same rate irrespective of race.

In sum, the relative-income hypothesis not only rests on a model of utility that is theoretically and empirically more plausible than the models used by competing theories, but it has also been consistently more successful in tracking observed patterns in consumption data. Yet Duesenberry's hypothesis is no longer even mentioned in any leading macroeconomics textbook. The ability of positional models to do a better job of tracking the data thus does not appear to be a sufficient condition for displacing traditional models.

Another economist speculated that many of our colleagues fear that taking positional concerns seriously might signal a certain lack of rigor. But as recent work has amply demonstrated, there is no barrier to formalizing models that incorporate such concerns (see e.g., Laurie Simon Bagwell and B. Douglas Bernheim, 1996; Ori Heffetz, 2004; Luis Rayo and Gary Becker, 2004).

Still another economist suggested that the aversion to positional concerns might be rooted in the fact that such models undermine our celebrated invisible-hand theorems. Yet the profession has incorporated numerous other forms of market failure into its arsenal of policy recommendations. Even the most ardent free-marketers, for example, are quick to concede a productive role for government intervention to curb pollution when transaction costs are high.

A final possibility I consider is that many economists reject positional models for the same reason they reject models that give policy weight to the preferences of sadists. Society

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[7] These models also predict the observed negative relationship between income inequality and average happiness levels (see Alberto Alesina et al., 2001).

[8] For a survey of the relevant studies, see Frank (1999 Ch. 6).

does indeed have a legitimate interest in discouraging envy. We should continue to teach our children not to envy the good fortunes of others. But such teachings, even if completely successful, will not eliminate welfare-reducing positional arms races, which stem less from envy than from the fact that many important rewards depend on relative consumption. The median household must keep pace with community spending on housing or else send its children to below-average schools. In any event, tax remedies for positional externalities are no more an endorsement of envy than effluent fees are an endorsement of pollution.

VI. Concluding Remarks

On examination, none of the explanations just considered appears to account for why economists advising the Bush administration were so confident that large income-tax cuts for top earners would make the economy more efficient. Setting equity concerns completely to one side, the soundness of this recommendation rests squarely on the assumption that positional concerns play no role in individual valuations. This assumption, however, is inconsistent with our best theoretical understanding of the origins and functions of human motivation; and it is flatly at odds with extensive direct and indirect empirical evidence regarding the nature of utility functions.

Models that incorporate concerns about relative position predict an equilibrium with too much expenditure on positional goods, too little on nonpositional goods. Tax cuts for the wealthy are spent largely on positional goods. Dollars that could have been used to pay for additional nonpositional goods (e.g., improving public education, conducting medical research, or inspecting the cargo containers that enter our ports) have been spent instead on larger houses and more expensive cars. In the light of available evidence, those who insist that such expenditure shifts enhance welfare confront a heavy burden of proof.

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